

Message Text

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ORIGIN COME-00

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TO USMISSION OECD PARIS

C O N F I D E N T I A L STATE 180523

EXCON

E.O. 11652: XGDS-1

TAGS: ESTC, COCOM, CZ, FR, US

SUBJECT: US DIGITAL-TO-ANALOG CONVERTERS TO CZECHO-
SLOVAKIA - IL 1565

REF: COCOM DOCS (75)1105 AND 1290

FOLLOWING IS RESPONSE TO QUESTIONS RAISED BY BELGIAN
AND FRENCH DELS:

1) THE D TO A THROUGHPUT RATE IS ACHIEVED AT 300,000
CONVERSIONS PER SECOND WHEN 8 INDIVIDUAL D TO A CONVERTERS
ARE SEQUENCED, USING EACH CONVERTER ONE OUT OF 8
POSSIBLE EVENTS. THE RATING OF EACH CONVERTER IN THIS
FASHION IS 40,000 CONVERSIONS/SECOND AT .04 PERCENT OF
FULL SCALE ACCURACY FOR THE CONVERSION OF 14 BITS PLUS
SIGN.

IF ONE CONVERTER IS CYCLED AT 125,000 CONVERSIONS/SECOND,
THE ACCURACY DROPS TO 2 PERCENT OF FULL SCALE AND THE 7
LEAST SIGNIFICANT BITS ARE NOT UTILIZED.

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THE CONSTRAINT OF LOWER SPEED OR LOWER ACCURACY IS THE
OPTION OF THE OPERATOR AS DICTATED BY THE PROBLEM AND
RESULTS REQUIRED IN TERMS OF ACCURACY OR SPEED OF
SOLUTION.

2) THE USE OF HYBRID COMPUTERS IN RESEARCH IS RELATED TO SIMULATIONS INVOLVING MATHEMATICAL MODELS REPRESENTING FLUID MECHANICS TYPE PROBLEMS. THESE MODELS INVOLVE NON-LINEAR EQUATIONS OF THE FIRST AND SECOND ORDER. TYPICAL SIMULATIONS WOULD BE HEART VALVE OPERATION, DRUG DIFFUSION STUDIES AND KIDNEY FILTRATION STUDIES. THE SPEED OF OPERATION IS REQUIRED WHEN PERFORMING SIMULATIONS RATHER THAN INDIVIDUAL PATIENT ANALYSIS STUDIES. CALCULATIONS ARE PERFORMED IN BOTH THE ANALOG AND DIGITAL PORTIONS OF THE HYBRID AND EXCHANGED IN A TIME CRITICAL MODE WHICH MAKE THE SIMULATIONS UNSTABLE TO TERMINATION AT LESSER SPEEDS. THE EXPANSION FROM 16 TO 24 D/A UNITS ALLOWS THE SOLUTION OF A 24 VARIABLE PROBLEM (ONE D/A PER VARIABLE) WHICH IS STILL A QUITE LIMITED CAPABILITY. I.E. A 100 VARIABLE MODEL OF THE HUMAN BODY IS A VERY LOW LEVEL APPROXIMATION. INGERSOLL

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